

UNIT 4

Logical puzzle — *Heart Failure*

Patients:

- A. 70-year-old man who had an acute anterior myocardial infarction 2 days ago and now vomits pink frothy sputum.
- B. 55-year-old woman with long-standing poorly controlled hypertension, exertional breathlessness, and LVH on ECG.
- C. 30-year-old previously healthy woman with sudden severe dyspnea, pleuritic chest pain and syncope.
- D. 65-year-old man with years of ischemic cardiomyopathy, increasing orthopnea, reduced exercise tolerance and low ejection fraction on prior echo.
- E. 40-year-old woman with severe chronic anemia (Hb 5 g/dL) complaining of fatigue but with warm extremities and bounding pulses.

Causes / Types of heart failure:

- Acute left ventricular failure due to myocardial infarction (acute pulmonary oedema).
- Chronic systolic heart failure (reduced ejection fraction) from ischemic cardiomyopathy.
- Right ventricular failure (acute cor pulmonale / RV strain).
- Heart failure with preserved ejection fraction (diastolic dysfunction) secondary to long-standing hypertension.
- High-output heart failure due to severe anemia.

Key clinical / investigation findings:

- I. Pulmonary oedema with frothy pink sputum and crackles; acute hypoxia.
- II. Reduced LVEF, dilated LV on echocardiography.
- III. Elevated JVP, clear lungs (or minimal pulmonary edema), signs of RV strain on echo / raised pulmonary pressures.
- IV. Left ventricular hypertrophy on ECG/echo, preserved EF, exertional dyspnea from impaired relaxation.

V. Wide pulse pressure, bounding peripheral pulses, warm extremities with high cardiac output.

Clues

1. The patient with **pink frothy sputum and marked hypoxia** had an **acute** cardiac event just days earlier.
2. The person with **LVH on ECG** had a long history of hypertension and a **preserved ejection fraction** on prior tests.
3. The young patient with **sudden pleuritic chest pain and syncope** is most consistent with an acute intrathoracic event causing **right ventricular strain**, not chronic ischemia.
4. The patient with a **known low ejection fraction** and progressive orthopnea has chronic ventricular dilatation from prior coronary disease.
5. The woman with **severe anemia** has signs of increased peripheral perfusion (warm, bounding pulses) — she does not have a low-output, cold extremity picture.

- Use the clues to match each **Patient** → **Cause/type** → **Key finding**.

RUBRICS

CRITERIA	DESCRIPTION	POINTS
1. Completeness	All 5 bones correctly identified (A,B,C,D,E)	5 pts
2. Accuracy	No wrong answers	3 pts
4. Neatness	Clear handwriting, no erasures	2 pts
	TOTAL	10 pts